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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,752	09/17/2003	Tohru Den	03500.014806.1	3824
5514	7590	04/26/2004	EXAMINER	
FITZPATRICK CELLA HARPER & SCINTO 30 ROCKEFELLER PLAZA NEW YORK, NY 10112			DIAMOND, ALAN D	
			ART UNIT	PAPER NUMBER
			1753	
DATE MAILED: 04/26/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/663,752	Applicant(s) DEN, TOHRU	
	Examiner Alan Diamond	Art Unit 1753	<i>eb</i>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 42-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 42-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/665,983.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>09172003</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. Figure 6 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance. The Examiner acknowledges that a letter was filed by applicant on September 17, 2003 stating that a substitute Figure 6 has been filed wherein Figure 6 is labeled "prior art". However, the Examiner could not find the substitute Figure 6 in the contents of the instant application. It is requested that said substitute Figure 6 be resubmitted.

Specification

2. The substitute specification filed September 17, 2003 has been approved by the Examiner and entered into the instant application.
3. The disclosure is objected to because of the following informalities: On page 1, at line 5, the term "now U.S. Patent 6,649,824" should be inserted after "2000" so as to complete the continuity data. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 42 is rejected under 35 U.S.C. 102(b) as being anticipated by Stirn et al, U.S. Patent 4,278,830.

As seen in Figure 3, Stirn et al teaches a solar cell comprising n-type germanium layer (24) which, reads on the instant electron acceptive charge transfer layer and, as seen in Figure 3, is formed of an aggregate of acicular crystals; a layer (25a) of GaAs, which reads on the instant semiconductor light absorption layer; and a layer (25b) of, for example, aluminum gallium arsenide, which reads on the instant electron donative charge transfer layer, and as seen in Figure 3, is formed of an aggregate of acicular crystals (see also col. 4, lines 5-25; and col. 10, lines 33-68). Since Stirn et al teaches the limitations of the instant claim, the reference is deemed to be anticipatory.

6. Claim 42 is rejected under 35 U.S.C. 102(b) as being anticipated by Gibbons, U.S. Patent 4,490,573.

As seen in Figure 3F, Gibbons teaches a solar cell comprising n-type polycrystalline layer (24) which, reads on the instant electron acceptive charge transfer layer and, as seen in Figure 3F, is formed of an aggregate of acicular crystals; intrinsic semiconductor layer (25), which reads on the instant semiconductor light absorption layer; and a p-type polycrystalline layer (27) which reads on the instant electron donative charge transfer layer, and as seen in Figure 3F, is also formed of an aggregate of acicular crystals (see also col. 4, lines 11-64). Since Gibbons teaches the limitations of the instant claim, the reference is deemed to be anticipatory.

7. Claims 42 and 45 are rejected under 35 U.S.C. 102(b) as being anticipated by Maruyama et al, U.S. Patent 4,433,202.

As seen in Figure 5, Maruyama et al teaches a solar cell comprising P-I-N layer (12) of polycrystalline silicon that has the same crystalline structure as layer (3) in Figure 1 (see col. 3, line 60 through col. 4, line 51; and col. 7, line 53 through col. 8, line 34). Thus, each of the p-type, i-type and n-type layers are part of the polycrystalline structure, and are an aggregate of acicular crystals. The n-type layer reads on the instant electron acceptive charge transfer layer, the i-type layer reads on the instant light absorption layer, and the p-type layer reads on the instant electron donative charge transfer layer. The crystals have a bottom surface diameter of 0.2 micron, and an average height of 1 micron, and thus, as aspect ratio of 5 (see col. 8, lines 12-14). Since Maruyama et al teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

Claim Rejections - 35 USC § 102/103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 42 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Chu, U.S. Patent 3,961,997.

Chu teaches a polycrystalline solar cell comprising a polysilicon n+ layer (14) which is an electron acceptive charge transfer layer; a p silicon layer (13) which is a semiconductor light absorption layer; and a polysilicon p+ layer (12) which is an electron donative charge transfer layer (see Figure 3B; and Example 1). It is the Examiner's

position that the polysilicon n+ layer (14) and the polysilicon p+ layer (12) inherently comprise an aggregate of acicular crystals. Since Chu teaches the limitations of the instant claim, the reference is deemed to be anticipatory.

In addition, the presently claimed limitation that either of the charge transfer layers is a semiconductor acicular crystal layer comprising an aggregate of acicular crystals would obviously have been present once Chu's solar cell has been prepared. Note In re Best, 195 USPQ at 433, footnote 4 (CCPA 1977) as to the providing of this rejection under 35 USC 103 in addition to the rejection made above under 35 USC 102.

10. Claim 42 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tanner, U.S. Patent 4,492,736.

Tanner teaches a solar cell comprising a microcrystalline silicon n-type layer (20), which is an electron donative charge transfer layer and, it is the Examiner's position, has an aggregate of acicular crystals; intrinsic semiconductor layer (18), which reads on the instant light absorption layer; and p-type layer (16), which is an electron donative charge transfer layer (see Figure 2; col. 3, line 48 through col. 4, line 46; and col. 6, line 54 through col. 7, line 34). Since Tanner teaches the limitations of the instant claim, the reference is deemed to be anticipatory.

In addition, the presently claimed limitation that either of the charge transfer layers is a semiconductor acicular crystal layer comprising an aggregate of acicular crystals would obviously have been present once Tanner's solar cell has been prepared. Note In re Best, 195 USPQ at 433, footnote 4 (CCPA 1977) as to the

providing of this rejection under 35 USC 103 in addition to the rejection made above under 35 USC 102.

11. Claim 42 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP 6-163957, herein referred to as JP '957.

JP '957 teaches a solar cell comprising polycrystalline silicon p-type layer (3), which is an electron donative charge transfer layer; i-type semiconductor layer (4), which reads on the instant light absorption layer; and n-type layer (5), which can be microcrystalline silicon and is an electron acceptive charge transfer layer (see paragraphs 0018, 0019, 0053, and Figure 1). It is the Examiner's position that the polycrystalline silicon p-type layer (3) and/or the microcrystalline n-type layer (5) inherently comprise an aggregate of acicular crystals. Since JP '957 teaches the limitations of the instant claim, the reference is deemed to be anticipatory.

In addition, the presently claimed limitation that either of the charge transfer layers is a semiconductor acicular crystal layer comprising an aggregate of acicular crystals would obviously have been present once JP '957's solar cell has been prepared. Note In re Best, 195 USPQ at 433, footnote 4 (CCPA 1977) as to the providing of this rejection under 35 USC 103 in addition to the rejection made above under 35 USC 102.

12. Claim 42 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP 8-213644, herein referred to as JP '644.

JP '644 teaches a solar cell comprising a p-type polycrystalline silicon layer (3p), which is an electron donative charge transfer layer; an i-type semiconductor layer (3i), which reads on the instant light absorption layer; and an n-type layer (3n) which reads on the instant electron acceptive charge transfer layer (see Figure 1; and paragraphs 0020-0031). It is the Examiner's position that said p-type polycrystalline silicon layer (3p) comprises an aggregate of acicular crystals. Since JP '644 teaches the limitations of the instant claim, the reference is deemed to be anticipatory.

In addition, the presently claimed limitation that either of the charge transfer layers is a semiconductor acicular crystal layer comprising an aggregate of acicular crystals would obviously have been present once JP '644's solar cell has been prepared. Note In re Best, 195 USPQ at 433, footnote 4 (CCPA 1977) as to the providing of this rejection under 35 USC 103 in addition to the rejection made above under 35 USC 102.

Double Patenting

13. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

14. Claims 42-45 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-53 of U.S. Patent No. 6,649,824. Although the conflicting claims are not identical, they are not patentably distinct from each other because, as seen in claim 1 of said patent, either of the charge transfer layers of the photoelectric conversion device can comprise acicular crystals that are metal oxide. The claims of said patent recite "a light absorption layer" existing between the charge transfer layers, but do not specifically recite that the light absorption layer contains a semiconductor. However, the term "a light absorption layer" encompasses any known light absorption material for photoelectric conversion devices, such as a semiconductor light absorption material, as here claimed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a known semiconductor light absorption layer for the light absorption layer in the claims of said patent because the term "a light absorption layer" in the claims of said patent encompasses any known light absorption material for photoelectric conversion devices, such as a semiconductor light absorption material.

15. Claims 42-45 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 17 and 18 of copending Application No. 10/101,462. Although the conflicting claims are not identical, they are not patentably distinct from each other because the photoelectric conversion device in the claims of said copending application recite that the electron acceptor charge transport layer comprises a zinc oxide acicular structure. The claim 17 of said copending application recites "a light absorption layer" existing between the charge

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transporting layers, but do not specifically recite that the light absorption layer contains a semiconductor. However, the term "a light absorption layer" encompasses any known light absorption material for photoelectric conversion devices, such as a semiconductor light absorption material, as here claimed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a known semiconductor light absorption layer for the light absorption layer in the claims of said copending application because the term "a light absorption layer" in the claims of said copending application encompasses any known light absorption material for photoelectric conversion devices, such as a semiconductor light absorption material.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patents 6,534,334 and 6,608,326 are hereby made of record.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Diamond whose telephone number is 571-272-1338. The examiner can normally be reached on Monday through Friday, 5:30 a.m. to 2:00 p.m. ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alan Diamond
Primary Examiner
Art Unit 1753

Alan Diamond
April 16, 2004

A handwritten signature in black ink, appearing to read 'Alan Diamond', with a stylized flourish at the end.